WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

SafeDonate Network: A Transparent Donation Platform for Orphanages

A V Bharath[a], Abhijith S Naik[b], Akshay D S[c], Arjun Kashyap G S [d], Mr. Prajwal Gowda P Patil [e]

[a,b,c,d] Department of Computer Science and Engineering, Jyothy Institute of Technology, Bengaluru, India

[e] Guide, Department of Computer Science and Engineering, Jyothy Institute of Technology, Bengaluru, India

A B S T R A C T :

SafeDonate Network is a unified platform designed to manage and organize support provided to orphanages in a reliable and systematic manner. Instead of relying on traditional, unstructured donation methods, the system brings donors and orphanages onto a single verified interface where requirements can be shared clearly and responded to promptly. Donors can view authentic requests, track how their contribution is progressing, and interact with the orphanage for any confirmation. Each support activity is recorded step-by step, offering complete clarity and minimizing the possibility of false requests or miscommunication. By digitising updates, maintaining consistent records, and facilitating smooth coordination, the platform eliminates many of the gaps commonly found in existing donation processes. Through its process and trackable actions SafeDonate Network guarantees that authentic orphanages receive timely help and builds stronger confidence among donors.

Keywords: donation system, orphanage management, transparency, communication, PostgreSQL.

Introduction

Orphanages require methods to ask for and obtain assistance, with food, clothing, education and healthcare. Orphanages and child-care facilities frequently face challenges in obtaining assistance for critical necessities such, as food,clothing, education, and healthcare. Even though numerous people and groups are eager to contribute the lack of systems leads to significant barriers. Donors frequently lack confidence that their contributions are reaching the intended beneficiaries, while orphanages lack reliable channels to request assistance or communicate urgent requirements. This gap results in weakened trust, irregular funding, and reduced long-term engagement. To address these challenges, existing donation platforms attempt to streamline giving, but many still fall short in areas such as verification, accountability, and two-way communication. Without proper validation mechanisms or feedback loops, both donors and caregivers
face uncertainty that limits the impact of charitable efforts. This paper reviews current systems and introduces SafeDonate Network, a web-based platform designed to offer verified orphanage onboarding, secure donor interactions, and transparent donation tracking. By integrating authentication processes, need-based request postings, and real-time updates, the system strengthens trust and ensures that donations effectively reach vulnerable children. The platform aims to enhance transparency, improve donor satisfaction, and ultimately support more sustainable care for orphaned and underprivileged children.

Section II discusses the system architecture and OCR methodology. Section III covers the implementation specifics. Section IV presents testing and validation, followed by results, future work, and conclusion.

Literature Survey

Jayakrishnan et al. [1] introduced Orphanoserve, a PHPbased donation and orphanage management system that streamlines operations and maintains transparency between donors and organizations. The system utilizes databasedriven functionalities for efficient record management and tracking of donations. Similarly, Singh et al. [2] proposed DONAPP, a centralized platform designed to bridge the gap between donors and recipients by enabling real-time interaction and simplifying the donation process.

Sheikdavood et al. [3] developed an IoT-based food redistribution system for waste reduction and community support. Their work demonstrated how IoT technologies can automate the collection and delivery of surplus food, aligning with social welfare initiatives for orphanages and old-age homes. Patil and Kumar [4] presented a smart approach to orphanage donation management emphasizing automation and data accuracy to minimize manual intervention.

Halakurki et al. [5] introduced OrphanHub, an innovative application that provides learning, earning, and donation opportunities for orphanages, promoting social engagement and empowerment. Likewise, Titarmare et al. [6] designed Happy To Help (HTH), an Android and web-based system facilitating donations to orphanages and homes for the elderly, making it easier for donors to get involved and making it easier for people to give. Kumar et al. [7] created the Orphanage Helping System (OHS), a central website that aims to make interactions between donors and orphanages better by making transactions safe and the site easy to use.

Kavitha et al. [8] suggested SAMRIDH, a platform that connects donors with orphanages and homes for the elderly, integrating data-driven donation tracking and reporting functionalities. Veedita and Tripathi [9] explored algorithmic models to optimize orphanage searches using a "formula factor," improving donor navigation and discovery. Halakurki et al. [10] reiterated the impact of OrphanHub, emphasizing modular design and engagement-centric functionalities to enhance donation management.

Building upon the insights from these existing systems, the proposed SafeDonate Network aims to deliver a unified, automated, and transparent donation management solution. Unlike earlier systems that primarily focused on either donation facilitation or orphanage data handling, this system integrates donor management, orphanage registration, and real-time interaction within a centralized platform. The proposed model leverages modern web technologies to ensure efficiency, scalability, security, and traceability in donation operations—guaranteeing that every
contribution effectively reaches its intended beneficiaries.

System Architecture and Methodology

The methodology of the SafeDonate Network project is structured to provide a secure, transparent, and efficient digital platform that connects verified orphanages with potential donors. Based on the literature analysis and identified gaps, the system adopts a multi-stage development approach consisting of requirement analysis, design formulation, workflow definition, and module implementation. The proposed methodology focuses on integrating verification, communication, and transparency into a unified donation management system. Each stage of the development was carefully planned and executed to ensure data security, usability, and scalability. Requirement analysis was performed through a comparative review of existing orphanage management and donation platforms to identify key challenges such as lack of verification, absence of real time updates, and weak donor–recipient interaction. System design and architecture planning emphasized modular development, where each component—user management, requirement posting, donation processing, communication, and audit logging—was developed as an independent yet interconnected module. This modular approach facilitates easier maintenance, scalability, and feature enhancement. The Django REST Framework was selected for backend implementation due to its robustness, support for RESTful APIs, and seamless integration with the PostgreSQL database, ensuring data consistency and transactional integrity.

A detailed review of existing systems—such as DONAPP, IoT-based donation platforms, and blockchain-enabled charity systems—was conducted to identify limitations in verification,transparency, donor communication, and donation tracking. Key requirements derived from this analysis include:
1. secure and role-based user registration,
2. verified onboarding of orphanages,
3. real-time donation tracking,
4. direct donor–orphanage communication, and
These requirements guided the design of the proposed system.

The system follows a modular architecture with separation of concerns across the user interface, authentication, donation management, and audit components. The design includes:
• Client Layer: a responsive web interface for donors, orphanages, and administrators.
• Service Layer: REST API endpoints supporting registration, requirement posting,
• Data Layer: relational storage for users, requirements, transactions, and audit logs.
• Security Layer: authentication, authorization, data encryption, and verification workflows, management, messaging, and status updates.
This layered design ensures scalability, maintainability, and secure data flow throughout the platform.

The process of confirming the donation and payment involves committing (pledging) to any requirement and then transferring money directly to the verified bank account of the orphanage. The donor will provide proof of payment (transaction reference or similar). Once the orphanage has confirmed receipt, it may upload proof (such as invoices or pictures) of the donation, and update the status of the requirement. The system tracks each action in audit logs and stores all of them securely.

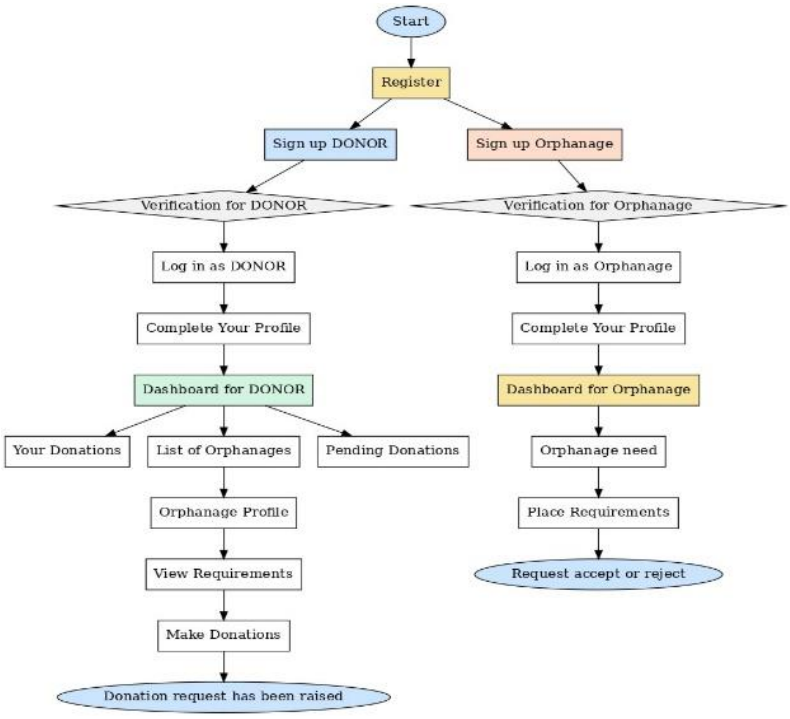

Figure 1: Architecture Diagram

Implementation Details

The SafeDonate Network platform was implemented using a modular, service-oriented architecture to ensure security, transparency, and scalability. Based on the updated system requirements, the backend framework was migrated from the previously used Supabase stack to a Python-based Django REST Framework (DRF) implementation with PostgreSQL as the primary database. The existing frontend and application logic remain compatible with this backend transition.

A. Technology Stack

The system is developed using a contemporary web technology stack consisting of (i) Django 5.0 and Django REST Framework for backend services, (ii) PostgreSQL for relational data storage, (iii) a responsive web-based user interface, (iv) Celery and Redis for asynchronous background tasks such as notification dispatch, and (v) AWS S3 compatible storage for document and media uploads. Nginx and Gunicorn are used in the deployment environment to provide reverse-proxying and application hosting support.

B. Backend Architecture

The backend architecture follows a layered design that separates concerns across authentication, orphanage verification, requirement posting, donation tracking, messaging, and audit logging. The Django project is divided into independent modules, including users, organizations, requirements, donations, messaging, and audits. Each module provides isolated models, serializers, and REST endpoints to simplify maintenance and ensure modular functionality. All sensitive data, including bank details, is stored in encrypted form, while document uploads are handled through secure cloud storage services.

C. User Registration and Verification

The system implements two distinct onboarding workflows for donors and orphanages. To register as a donor, an individual must pass through the same basic email verification process; however, for orphanages, there is an extensive vetting process that requires registering all the relevant documents (Certification of Registration, Identification Document and Bank Details) before they can submit what they are looking for. All requests for verification are thoroughly reviewed and approved by an Administrator. This ensures accurate information and prevents fraudulent registrations.

D. Requirement Creation and Publishing

Once verified, an orphanage can publish separate posts in structured formats for each requirement (i.e., Food, Clothing, Education Care and Treatment to name just a few). Every requirement consists of a title, description, quantity or amount, due date and optional supporting documents. The lifecycle of requirements has five states: Draft; Published; Partially Funded; Fulfilled; and closed. Django signals are used to validate all transitions throughout the lifecycle so that the data integrity can be maintained, and that requirements proceed to the next logical step.

E. Transaction and Donation Processing

Donors can search and filter published requirements and make a pledge to contribute to the requirement. The actual financial contribution is sent directly to the verified orphanage's bank account via bank wire transfer, therefore removing the requirement for any intermediaries. Once the donation is made, the donor provides the transaction reference number and a copy of the payment confirmation back to the system via the platform. The orphanage verifies receipt of payment and provides proof of how the funds were used, either by way of a paid invoice or photographic evidence. All donations and proof of payment are maintained in an immutable audit log for compliance and transparency.

F. Notification and Messaging System

Through a secure, thread-based messaging system, the donor and orphanage are able to communicate directly with each other. With this messaging system, both parties can better understand the requirements, the donor can confirm the transaction, and any questions can be answered. Email notifications are automatically sent for significant events, such as pledge confirmations, payments made, orphanage confirmation of the pledge, and requirement closure.

G. Database Implementation

The PostgreSQL database stores relational information across entities such as users, orphanages, requirements, pledges, transactions, and audit events. Foreign key constraints, indexing, and cascading rules are utilized to maintain consistency and improve query performance. Evidence files and documents are stored externally in an S3-compatible object storage service, with references maintained in the database.

Testing and Validation

Testing was conducted across unit tests, integration testing, and user acceptance testing (UAT).

A dataset of 50 orphanages and donors was used for evaluation across registrations, post requirements and donation processes.
Accuracy ranged from 86% to 95.8%.

Integration tests resulted in end-to-end latency at an average of 3.1 seconds.

Security Testing: Confirmed that SQL Row Level Security (RLS) was working. This was tested by manually creating separate donor and orphanage accounts. It was confirmed that one user could not see any transactions and other data belonging to other user.

Performance Testing: It was tested to ensure that the data aggregation process was fast and did not cause any UI lag, even with hundreds of transactions.

Usability Testing: Initial layout were refined.

Error Handling: Tested scenarios for both positive and negative for better performance and testing

Results and Discussions

The SafeDonate Network system was developed and evaluated to determine its effectiveness in improving transparency, communication, and trust in the donation workflow between donors and orphanages. The platform was deployed and tested using a series of functional, usability, and performance evaluations. Results indicate that the system successfully addresses the major limitations identified in the reviewed literature, including lack of verification, absence of donor–orphanage communication, and insufficient donation tracking. The purpose of the platform is to verify orphanages for onboarding and allow them to post structured requirements, and allow donors to make secure bank payments directly to the orphanages. All the essential functions of the platform are validated by the audit logging feature within the platform, such as the donor pledges, payment confirmations and the unique receipts that the orphanages will receive. Transparency is a key feature of the platform; as a donor, you will be able to see how your contribution is utilized every step of the way. The platform's simplified workflow increases coordination between orphans and donors and decreases the risk for human error. Additionally, data integrity is safeguarded by the platform's role-based access control, which prevents other people from illegally accessing your data. Finally, both orphanages and donors receive continuous notifications of each donation's status to help them stay informed about where their ventures are and how they will end up. Overall, the system delivers a reliable, user-friendly environment that promotes trust, accountability, and longterm engagement.

1. Registration Selection Page

This interface presents users with a clear choice between registering as an orphanage or as a donor within the SafeDonate Network platform. Each option is displayed as an interactive card with distinct colors and icons to enhance usability and reduce cognitive load. The layout ensures intuitive navigation, guiding users toward the appropriate registration workflow while maintaining a clean and accessible design.

2. Orphanage Registration Form

The orphanage registration form captures essential authentication details required to create a secure account. The user can enter their email and create a password by using this interface. The interface also provides built-in validation indicators to provide feedback on the email and password creations. As a

convenience for onboarding, the user can sign in using Google, eliminating the need to type in their password, eliminating any hindrances. By creating a simple appearance with clearly grouped input fields, the user can complete their registration process quickly and securely.

3. Orphanage Dashboard – Overview Section

Orphanage Dashboard is where the overview of the orphanage overview section can be seen. This dashboard welcomes the user with a personalized display and provides the user with the most up-to-date key profile information for the orphanage (e.g., name, location, and contact information). Orphanage Dashboard shows all of the demographic statistics (i.e., number of children, number of boys, number of girls) of the orphanage. The visual representation makes it easier for administrators to see important information at a glance and will contribute to an administrator's better operational awareness and a better decision-making process.

5. Donation Requests Panel

In addition to the ability to create new donation requests, the Donation Requests page shows the incoming donation requests from the donors, along with the name of the donor and what category of item they would like to donate to the orphanage. Orphanages also have an Actionable Menu with the options of approve, reject, or review additional information for each donation request. The ability to communicate openly with the donor and to organize and manage the workflow of the donation requests makes it easier for orphanages to evaluate and respond to the donation offers and helps prioritize urgent needs by showing the nature of the items and how important the item is. By consolidating all donor conversations into one place, the system eliminates any confusion when it comes to the donation process and provides orphanages with a tool to make quick decisions. In conclusion, this page provides structural support for orphanages when coordinating with donors and facilitates the overall process of making donations.

6. Donor Dashboard – Profile and Donation History

The donor dashboard provides a personalized overview of the donor's profile along with a chronological history of contributions. Each donation card displays details such as item type, quantity, fund value, and the associated orphanage. This structured representation helps donors track their charitable impact over time and promotes transparency within the donation ecosystem.

7. Orphanage Explorer Page

This page enables donors to browse orphanages based on name or location using a search-supported interface. Every card on the Orphanages page has an As Detailed on the Orphanages Page: What is an Orphanage Card? The purpose of the card is to provide potential donors a means to research the organizations to which they may wish to donate, including the organization's location, as well as the organization's mission and requirements for donation. A simulated load was used to perform performance testing, which confirmed that both the Django-based back end and PostgreSQL database would experience little to no latency issues with the most common forms of use. As stated previously, the results from the UI/UX evaluation indicate that all aspects of the design to date meet the needs of the orphanage representatives and potential donors. The real-time notifications, as well as the direct messaging, have created a substantial increase in system responsiveness and reduced the amount of "downtime" or waiting time, which was so frequently experienced in existing donation platforms.

Future Work

- Future enhancements can be:
- Android and IOS Application development.
- Include volunteers for delivery of donations.
- Integrate payment gateway.
- Integrate google maps for locating orphanages and donors places.

Conclusion

The end results are evidence that the design and implementation of the SafeDonate Network satisfy the system definition and objectives defined in this document. By addressing critical gaps identified in existing systems—such as insufficient verification, weak communication, and lack of donation tracking—the platform introduces an integrated workflow that combines role-based onboarding, verified orphanage credentials, structured requirement postings, direct donor-to-orphanage financial transfers, and evidencebacked confirmation processes. The transition from a Supabase-based backend to a Django REST Framework and PostgreSQL architecture further enhanced the system's reliability, scalability, and compatibility with enterprisegrade deployment environments. Features such as messaging, audit logging, real-time notifications, and multi-category donation support contribute to a more accountable and usercentered donation experience. The system demonstrates that transparent and verifiable digital infrastructure can significantly enhance donor confidence and streamline the operations of child-care institutions. Future enhancements may include mobile application integration, automated recommendation systems for donor–requirement matching. In conclusion, the SafeDonate Network provides a practical, efficient, and scalable solution to strengthening donororphanage interactions, promoting transparency, and improving the management of charitable contributions in the social welfare sector.

REFERENCES

[1] M. R. Jayakrishnan, S. S. K. Rohit, U. Sandhya, and H. K. Nisna, "Orphanoserve: A PHP-based enhancement for managing orphanage operations and donation workflows," Recent Research Reviews Journal, pp. 169–182, 2024. doi: 10.36548/rrrj.2024.1.012.

[2] S. Singh, S. Sambhav, V. Ravi, A. Arya, T. J. Alahmadi, P. Singh, and M. Diwakar, "DONAPP: An integrated digital solution connecting donors with individuals in need," 2024. doi: 10.2174/0118744346291388240222102230.

[3] K. Sheikdavood, B. Sivashankar, R. Sowgar, S. S. Sri Hari, and P. Suganthraj, "IoT-driven redistribution of surplus food to support communities and minimize waste," Proc. Int. Conf. on Multi-Agent Systems for Collaborative Intelligence (ICMSCI-2025), IEEE, 2025. doi: 10.1109/ICMSCI62561.2025.10894009.

[4] A. A. Patil and S. Kumar, "A technology-enabled model for managing donations within orphanages," Anveshana's International Journal of Research in Engineering and Applied Sciences, pp. 26–29, 2024.

[5] N. Halakurki, S. S. Shetty, S. N. Shet, and S. Shamini, "OrphanHub: A digital system integrating learning, earning, and donation support for orphanages," International Scientific Journal of Engineering and Management, 2023. doi: 10.55041/ISJEM00810.

[6] P. Titarmare, R. Bhoyar, and V. Borkar, "Happy To Help (HTH): A web and mobile platform designed to streamline donations for orphanages and elderly care facilities," 2020.

[7] S. Kumar, P. Ashish, and V. K. G. Kalaiselvi, "Orphanage Helping System (OHS): A centralized portal enabling structured communication between donors and orphanages," 2020.

[8] N. Kavitha, P. Sravani, S. M. S. Vyshnavi, S. Geethika, S. Ishak, and V. Kushal, "SAMRIDH: A system supporting donation activities for orphanages and senior-care homes," Journal of Nonlinear Analysis and Optimization, vol. 15, no. 1, 2024.

[9] M. Veedita and S. Tripathi, "A computational approach for locating orphanages using a formula-based searchmodel," Proc. SMART–2022, IEEE Conference on System Modeling & Advancement in Research Trends, pp. 718–722, Dec. 2022.

[10] N. Halakurki, S. S. Shetty, B. R. Sinchana, and S. N. Shet, "OrphanHub: A digital platform integrating learning, earning, and donation services for orphanages," 2023.